

Appl. No. 10/822,995
Attorney Docket No.: 2001B127B/2
Amdt. dated February 14, 2006
Reply to Office Action of December 20, 2005

REMARKS/ARGUMENTS

Status of Claims

The current text of the claims in the application is given in the Listing of Claims above. Amendments made to Claim 35 in Applicants' last response have been incorporated into the clean text of Claim 35 which is now listed as having been previously presented. Claims 30-35 remain in the application and are under Final Rejection.

Invention Synopsis

The present invention as currently claimed in this application is directed to processes for adding heat to or initially increasing the temperature of a reactor system for converting oxygenates to olefins. This is accomplished by heating catalyst in the catalyst regeneration zone of such a reactor system by combusting a heating fuel which is added to the regeneration zone along with the catalyst. The heating fuel is one which must have certain specified autoignition characteristics and certain maximum amounts of oxygenate conversion catalyst-poisoning contaminants such as sulfur, nitrogen, nickel, and vanadium. Catalyst heated in this manner in the regeneration zone is then circulated back to the oxygenates-to-olefins (OTO) reaction zone. This procedure can thus be used to add heat to the OTO reactor either during initial startup or during periods of feed interruption.

Art Rejection

Claims 30-35 have been finally rejected under 35 USC §103(a) as being allegedly unpatentably obvious over Lattner et al. (U.S. Patent No. 6,023,005, hereinafter "Lattner") in view of Harandi et al. (U.S. Patent No. 4,939,314, hereinafter "Harandi"). The Examiner maintains the position that it would have been obvious to add heating fuel to the catalyst regeneration zone of the Lattner OTO set-up in view of the Harandi disclosure of heating fuel added to and burned in the regenerator of the Harandi oligomerization process. Such a rejection is again respectfully traversed after Final Rejection.

Lattner discloses an oxygenates to light olefins (OTO) process wherein a catalyst regenerator is used to remove coke deposits from only a portion of the total catalyst inventory in

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the OTO reaction zone so as to improve selectivity of the process to production of light olefins. Harandi discloses a high pressure oligomerization process which includes an on-line low pressure catalyst regeneration set-up. Catalyst from and to the Harandi oligomerization reactor is passed through pressure adjusting lock hoppers (and a stripping zone) to and from a low pressure catalyst regenerator. For purposes of temperature control in the catalyst regenerator, and while recirculating catalyst is being held and processed in the lock hoppers or stripping zone, Harandi discloses that a fuel gas may be added to the regenerator.

In the Final Rejection, the Examiner has repeated the previously presented reasons for rejecting the claims in the case over Lattner in view of Harandi and has also provided additional comments said to be in response to Applicants' arguments concerning this previously applied rejection. Since it would serve no purpose to burden the record by merely repeating Applicants' previously provided arguments, Applicants would instead like to comment on the Examiner's "Response to Arguments" section as newly provided in the Final Rejection. It is respectfully submitted that in this "Response to Arguments" section, the Examiner seems to be considering only selected portions of Applicants' previous remarks and, even then, is mischaracterizing certain of Applicants' positions with respect to the teachings of the applied references.

With respect to Applicants' previously provided paragraphs concerning what each of the two applied references do and do not show, the Examiner urges that the Applicants are attacking the obviousness rejection by improperly attacking each reference individually. In the first place, a consideration of what the combined disclosures of two references in a reference matrix would teach or suggest to the skilled artisan can only be undertaken by discussing what each reference by itself does or does not describe or suggest.

More importantly, after discussing each reference individually, Applicants do go further and address the combined effect of their teachings. It is acknowledged that, in the present situation, Lattner discloses some of the elements of Applicants' claimed invention and Harandi also discloses some of the elements of the claimed invention. There are even some elements of the present invention which are not disclosed by Lattner but are disclosed by Harandi (e.g., burning of fuel added to the regenerator to add heat to the regenerator.). But the skilled artisan would obviously use that feature of Harandi in the Lattner process only if there were something

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in the combined teachings of both references which would lead the skilled artisan to do so. And as discussed hereinafter in more detail, there is nothing in either reference which would lead the skilled artisan to make that combination.

There are also elements of the present invention which are not taught or suggested in either of the applied references. Neither Lattner nor Harandi, for example, teaches the use of the circulating catalyst inventory to carry heat added by fuel combustion in the regenerator back to the reactor. Lattner fails to disclose this because there is no fuel added to and burned in the Lattner regenerator. Harandi also does not disclose this element because the fuel added to and burned in the Harandi regenerator is apparently for the sole purpose of maintaining temperature control within the Harandi regenerator, not in the Harandi reactor. Furthermore, catalyst heated in the Harandi regenerator (whether by coke combustion or by combustion of added fuel) must be routed back to the Harandi reactor through pressure adjusting lock hoppers and steam strippers wherein the heated catalyst is likely to be cooled from its regenerator temperature before it reaches the reactor. So even if the teachings of Lattner and Harandi are combined, albeit improperly, Applicants' claimed invention still does not result.

In attacking Applicants' characterization of the applied references, the Examiner, in his "Response to Arguments," seems to be saying that Applicants are incorrectly asserting that these patents do not disclose catalyst removal from the reactor, catalyst regeneration and then recycle of catalyst back to the reactor. This is not a correct characterization of Applicants' position. Applicants acknowledge that both references disclose this general set-up for reactivating catalysts being used in the reactor. But the specifics of the two reference processes are significantly different from each other. And those differences would prevent the skilled artisan from combining the teachings of these two documents in the first place, even though both deal with catalyst removal from the reactor for catalyst regeneration purposes.

One significant difference between the two referenced processes, of course is that Lattner involves a reactor wherein an oxygenate-to-olefins process is conducted whereas Harandi involves a reactor wherein a high pressure olefin oligomerization process is carried out. The required high pressure conditions in the Harandi reactor lead to the essential use of the depressurizing and re-pressurizing lock hoppers in the Harandi catalyst regeneration cycle. The

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skilled artisan would never employ this Harandi pressure adjustment setup for the Lattner catalyst regeneration procedure where there is no high pressure oligomerization reaction essentially taking place in the Lattner reactor.

More importantly, the process of the Lattner invention requires that not all of the catalyst withdrawn from the reactor be sent to the Lattner regenerator so that only a portion of that withdrawn catalyst is regenerated. This is so an appropriate level of coke can be thereby maintained on the catalysts to carry out the improved OTO reaction in the Lattner reactor. Harandi, on the other hand, sends all of the catalyst withdrawn from its oligomerization reactor to the regenerator wherein coke is removed by coke combustion. So the substitution of the Harandi regeneration setup for the one used in Lattner would eliminate the Lattner feature of only partial catalyst regeneration and would thereby render Lattner unsuitable for its intended purpose. It has been long established that if a proposed modification would or might render a prior art invention unsuitable or unsatisfactory for its intended purpose, then there is no suggestion or motivation to make that proposed modification. [See *In re Gordon*, 221 USPQ 1125 (CAFC, 1984).] Using the Harandi regeneration procedure in Lattner would do just that, thereby rendering the combination of the Lattner and Harandi teachings one which would not obviously be made, notwithstanding the fact that both references disclose catalyst inventory recirculating between reactor and regenerator.

Finally, not only would the above-discussed differences in reaction types and regeneration setups prevent the skilled artisan from obviously combining the teachings of Lattner and Harandi, there is furthermore no motivation in either reference to combine only selected features from each reference for the purpose of solving the problem addressed by the instant invention. The instant invention provides a means for solving the problem of adding heat (but not contaminants) to an OTO reactor during initial startup or periods of feed interruption. These situations, and the need for heat input to the reactor during such situations, are nowhere mentioned, addressed or hinted at in either the Lattner or Harandi references. The only motivation for adjusting and selecting process features to address this additional heat-to-the-reactor problem is found in and gleaned from Applicants' own specification and not in or from

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the applied prior art. This then is the essence of improper reference selection and combination in hindsight as discussed in the *In re McLaughlin* case cited by the Examiner.

Given all the foregoing considerations, it is again submitted that the reference combination of Lattner in view of Harandi is not one which is properly made in rejection of Applicants' claims in the first place. And even if made, the combined teachings of these two patents still do not teach or suggest the particular process embodiments set forth in Applicants' Claims 30-35 as presently written. Continued rejection of these claims under 35 USC §103(a) over Lattner in view of Harandi would therefore be improper.

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CONCLUSION

Applicants have made an earnest effort to place their application in proper form and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, consideration of Applicants' additional arguments presented herein after Final Rejection, withdrawal of the claim rejection under 35 USC §103, and allowance of Claims 30-35 are respectfully requested.

It is also respectfully requested that the Examiner expeditiously notify Applicants' undersigned attorney as to the disposition of the remarks and additional arguments presented herein after Final Rejection in accordance with MPEP §714.13.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below

Respectfully submitted,

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